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REVIEWS

Chemical Analyses of Igneous Rocks. Published from 1884 to 1913 Inclusive. By HENRY STEPHENS WASHINGTON. U. S. Geol. Survey, Prof. Paper 99. Washington: 1917.

Students of petrology are still further indebted to Dr. Washington for a great store of chemical data in the form of 8,602 rock analyses, gathered together from all manner of geological and petrographical publications and from personal contributions of analyses which were awaiting publication. The value of such a carefully prepared and vast accumulation of rock analyses is obvious to all who desire to know the chemical composition of igneous rocks and wish to compare the rocks of different regions. The labor involved in collecting and arranging the analyses and in calculating the mineral norms is indicated by the statement of the author that "on an average the 4,980 analyses in Part I took 45 minutes apiece and those in Parts II, III, and IV (3,622) took about 30 minutes or more apiece," in all more than 5,546 working hours.

The analyses have been arranged according to their quality in four groups: (I) superior analyses of fresh rocks, designated as "excellent," "good," and "fair," except those which could not be classified properly in the quantitative system of rock classification; (II) superior analyses, generally good or fair, not properly classifiable in the quantitative system; (III) superior analyses of tuffs and of weathered or altered rocks; (IV) analyses deemed poor or bad. Nearly 5,000 analyses have been classified and arranged according to the quantitative system of classification of igneous rocks, and form the major portion of the collection, which includes those in the first collection by Dr. Washington, published as *Professional Paper 14*, in 1903. The new publication is a revision and expansion of the former, in which Part I contained 1,711 superior analyses. The amount of expansion is shown by a comparison of the number of analyses published in each paper. In No. 14 the total was 2,881, of which 1,711, or 59 per cent, were placed in Part I. In No. 99 the total is 8,602, of which 4,980, or 58 per cent, are put in Part I. There are 5,721 more in the new collection, or nearly three times as many as in the former one. This shows an increased production in thirteen years of double that of the previous sixteen years and a betterment of the quality, since nearly 1,500 superior analyses are placed in Parts II and III of the new collection; that is, 6,471 superior analyses were made in the thirteen years since 1900.

The text contains a critical discussion of the character and use of analyses: their representativeness, accuracy, and completeness. The method by which the author rated the analyses is explained. It is this rating, which was employed in the earlier publication, that has had much to do with the marked improvement in more recent analytical work. An inspection of the geographical distribution of the localities from which rocks have been analyzed shows some extensive gaps, even in regions accessible to petrographers, as the author points out. There is an important commentary on names that have been applied by various petrographers to divisions of the Quantitative System of Classification, as well as a concise statement of the Quantitative System, and of the method of calculating norms from chemical analyses, besides numerical tables for use in the calculation. It would be a great help to petrographers if this portion of the book were printed and published separately.[1] The thorough indexing of the book according to four systems adds greatly to its usefulness.

J. P. IDDINGS